STAVATTI™

STAVATTI MILITARY AEROSPACE
TACTICAL AIR WARFARE SYSTEMS DIVISION

NATO CONFIGURATION STATEMENT

SPECIFYING THE GENERIC NATO/ALLIED CONFIGURATION
&
STANDARD SYSTEMS LISTING FOR THE

F-26S STALMA™

MULTI-ROLE FIGHTER

PREPARED AND RELEASED BY:

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This Generic Configuration Statement Corresponds to the F-26S STALMA™ Multi-Role Fighter, Fixed Wing Aircraft of BLOCK 10 Configuration For Direct Commercial Sales (DCS) to Qualified U.S. and NATO/Allied Air Arms.

DOCUMENT TYPE: Aircraft Configuration Specification

DOCUMENT NUMBER: SD-65338-WS

DOCUMENT DATE OF ISSUE: 13 DECEMBER 2004

MODEL SPECIFIED: F-26S STALMA™

AIRCRAFT TYPE: Fixed Wing; Multi-Role Fighter

AIRCRAFT CONFIGURATION BLOCK: BLOCK 10

CONFIGURATION CONTROL NUMBER: F-26S/10/NATO/01

UNIT FLYAWAY COST: $40,000,000 to $60,000,000

SPECIFIC CUSTOMER(s): NATO Member Nations/U.S. Allies

CUSTOMER REQUIREMENT: Multi-Role Fighter Aircraft

CONTRACT TYPE: Fixed Firm Cost (FFC)

SALE TYPE: Direct Commercial Sale (DCS) with Potential FMS Components as Necessary (for COMSEC/TRANSEC/TEMPEST/GPS PPS/IFF and Intelligence Suport export via the DCA as FMS government to government transactions).

CONTRACT TIME-FRAME: 2008-2038

PURPOSE & SCOPE: This document serves as a Generic Configuration Specification and Standard Systems Listing for the STAVATTI F-26S STALMA Multi-Role Fighter aircraft as configured specifically for marketing and sale to the Air Defense Arms of all NATO member nations and consistent U.S. allied nations including, but not limited to, Australia, New Zealand and Japan. This document describes/details a general configuration, often regarded as the STAVATTI STANDARD WEAPON SYSTEM CONFIGURATION for the F-26S STALMA of BLOCK 10 production configuration. This document is not to be misconstrued as a proposal, or information submitted in response to a Request For Proposal (RFP). This document is for general, Rough Order Magnitude (ROM) information transfer purposes only in anticipation of market studies/information requests by relevant NATO/Allied air arms. The information contained within this document is held to the unclassified/unrestricted level and is not subject to export control for the purpose of maximizing ease of transfer to relevant NATO/Allied individuals. Information relating to specific weapon system configurations to address individual NATO/Allied customer requirements is beyond the scope of this document. Requests for said information, including greater technical detail regarding the F-26 STALMA platform is subject to export control/ITAR and may require notification of and/or approval from DDTC prior to the release of said information dependent upon specific end user nation. Furthermore, the transmission of technical data, including detailed performance envelopes may require the receipt of a DSP-5 export license prior to release. STAVATTI is eager to prepare said additional information upon request as well as obtain the necessary DDTC approvals to facilitate further information release. All information within this document is considered "forward looking" and relates to an aircraft anticipated to enter Low Rate Initial Production (LRIP) between 2008 and 2010. STAVATTI serves as the prime contractor responsible for the design, development, manufacture and total systems integration, product service & support for the F-26 STALMA.

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OVERVIEW: STAVATTI recognizes a potential requirement for a new, sixth generation Multi-Role Fighter (MRF) aircraft for service within NATO Air Defense Forces, as well as the Allied Air Defense Forces of Australia, New Zealand, Japan and other qualified nations, within the first quarter of the 21st century. In anticipation of this requirement, STAVATTI has undertaken the development of the F-26S STALMA Multi-Role Fighter. The F-26S STALMA will serve as a direct successor to F-16, F/A-18, F-1, F-2, F-4 Mirage 2000, MiG-29 and a variety of additional combat aircraft while significantly improving NATO/Allied capabilities.

Presently under development as a corporate initiated, privately financed, commercial program, the F-26 STALMA series is intended to enter Low Rate Initial Production (LRIP) in 2007-2010, followed by Full Scale Production (FSP) in 2009-2012. STAVATTI will therefore be in a position to begin initial deliveries of F-26 aircraft by 2008-2010 at a projected rate of 15 to 25 aircraft per year and 50 to 100 aircraft annually thereafter. STAVATTI anticipates the majority of NATO/Allied nations will be in a position to procure new MRF aircraft within the 2008-2016 time-frame, for which there is a potential for over 700 sales to NATO.

STAVATTI intends to conduct F-26 STALMA sales as a Direct Commercial Sale (DCS), however, STAVATTI is open to the possibility of conducting the sale via U.S. DoD sponsored FMS. Furthermore, there is a distinct possibility that contracts with NATO/Allies will stipulate the licensed production of the F-26S on the component, or system level, by a resident based Aerospace Manufacturer and/or Heavy Industrial Manufacturing Concern. STAVATTI envisions the production of the F-26 STALMA within multiple nations facilitated through a Joint-Venture structure which may feature both public and private equity elements.

A generic configuration of the F-26 STALMA which may be potentially suitable for export to and procurement by NATO/Allied Air Defense Arms (pending DDTC approval and export licensing) is described herein This generic configuration is applicable only to the Air Defense Arms of NATO member nations. The systems configuration of F-26 aircraft developed for export to non-NATO Allied nations may differ significantly from the systems configuration described herein dependent upon DDTC export approval. Specific Weapon System Configurations (SWSCs) may be developed by STAVATTI to satisfy individual air defense force requirements upon request.

All information contained within this document is provisional and subject to modification based upon the actual measured results of flight testing/validation and qualification. All information contained herein is considered “forward looking.” Exportability of actual F-26 STALMA aircraft systems configurations, including avionics, sensors, countermeasures, armament, and low observability technology is subject to ITAR restrictions /DDTC export control.

COSTS: F-26S STALMA per unit flyaway cost is approximately $40,000,000 to $60,000,000 ($40 to $60 million) in 2004 USD. Actual F-26 STALMA costs are dependent upon specific customer aircraft systems and capabilities.

DESIGN FEATURES: The F-26 STALMA is a single place multi-role fighter developed for production by STAVATTI MILITARY AEROSPACE, Tactical Air Warfare Systems Division. The aircraft is designed for all-weather supersonic operation at both low and high altitudes. Mission capabilities include: Air superiority and medium range Combat Air Patrol (CAP); Deep Penetration Precision Strike (DPPS) utilizing conventional or nuclear devices; and Close Air Support (CAS) with secondary attack of ground based tactical targets. Emphasis has been placed upon producing a high performance aircraft with high acceleration, climb and instantaneous turn rates with exceptional maneuverability to fulfill both close-combat, dogfight and air defense roles. Secondary emphasis focuses upon Low Observable (LO) features and supercruise.

Power is provided by a single 35,000 lb class augmented turbofan. A dual air inlet system, consisting of a ventral pitot and lateral, bifurcated oblique shock air intakes supplies powerplant mass flow. The wing is equipped with leading and trailing edge flaps and employs variable geometry. Lon-

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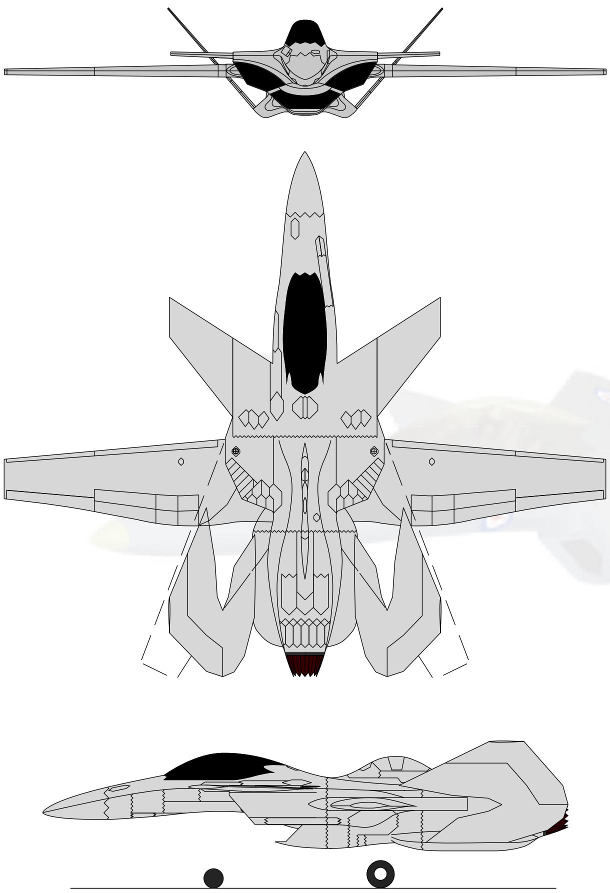
gitudinal stability is provided by a canard foreplane and a V-tail. Directional stability is provided by a V-tail. Stability augmentation and flight control consists of quadrupleplex, digital fly-by-wire. Tricycle landing gear consisting of a forward retracting oleo-pneumatic nose strut and rearward retracting, trailing-link main gear is employed. Stores are carried externally on eight wing pivot and five fixed fuselage hardpoints.

GENERAL ARRANGEMENT:



ACCOMMODATION: The aircraft flight crew consists of a single pilot seated on a Martin Baker MK16 zero/zero ejection seat. The cockpit has been designed to accommodate both male and female crew members within the 5 ft 4 inch 100 lbs to 6 ft 4 inch 250 lbs height. and weight, 95th percentile limitations. Crew member design weight, including survival equipment, is 260 lbs.

A two-place tandem variant of the F-26 STALMA, designated the F-26T (Trainer or Thermonuclear penetration as in the case of the Mirage 2000N), will also be available, incorporating a student and instructor (or pilot and WSO) in fore and aft crew stations respectively. The F-26T aircraft is largely similar in performance and specifications to the F-26 with the exception of an extended fuselage length to 53.0 ft.

STRUCTURE: The aircraft primary structure is aluminum, scandium aluminum, titanium and stainless steel alloys in geodetic or traditional form. carbon fiber, aramid, and metal matrix composites are employed as secondary structures. Principal matrix material for carbon and aramid fiber composites is NASA LaRC developed RP-46 improved, high-temperature PMR polyimide. Approximately one third of the airframe consists of conventional alloy construction while two thirds of the airframe is of composite construction.

The aircraft is designed for an operational service life of over 15,000 hours, accumulating an average of 500 hours per annum. Service life estimates include up to 5,000 hours at airspeeds in excess of MACH 2.4/skin temperatures of 550º F. Aircraft fatigue life is based upon 18,000 landings and fatigue testing to 75,000 hours. Service life of carrier variants includes 4,000 catapult launches and 4,000 traps. The airframe will exhibit load limits of +15/-6 to 27,850 lbs design gross weight and +9/-3 to 60,750 lbs maximum gross takeoff weight. Ultimate load factors are 1.5 times design load factors. A Vehicle Systems Simulator (VSS) will be continuously subjected to simulated airloads throughout aircraft production life for fatigue cycle validation and total lifetime confirmation.

FUSELAGE: The F-26 fuselage is a semi monocoque alloy and composite structure composed of three modules. Consisting of the forward fuselage, mid fuselage and rear fuselage, the fuselage modules employ triple redundant construction composed of an alloy spaceframe core, a graphite unibody and aramid body panels. Critical fuselage loads are distributed equally amongst the alloy subframe and the graphite unibody.

The alloy subframe (Ti-6A1-4V titanium, 7075 aluminum, 7050 aluminum, scandium aluminum, Elgiloy and PH 15-7 stainless steel) provides a solid mounting platform for all critical airframe components and a fatigue resistant, design load carriage structure. The subframe is of geodetic configuration, building upon design methodologies pioneered by Sir Barnes Wallis/Vicker's Wellesley & Wellington Bomber and Brant Goldsworthy. The subframe is enveloped by a unique, double-hull composite structure consisting of a graphite unibody inner-hull and aramid external-hull/skin. The composite double-hull serves in both structural, aerodynamic and low-observable capacities.

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The graphite unibody (IM9/RP-46) provides fuselage form definition and unitary structural integrity. The aramid (Kevlar 49 & 29/RP-46) body panels provide aerodynamic definition and combat damage tolerance. The inner-hull and outer-skin are physically separated on the order of one to two inches. This physical separation results in a cavity which serves as an integral element in STALMA low observability and armor/protective systems.

WINGS: F-26 wings are hydraulically actuated, variable-geometry cantilever mid-wing monoplane type of blended wing/body design. Wing sweep varies from 5º (unswept) to 70º (maximum sweep) with wing span being 57 ft, 0 in and 30 ft 7.5 in respectively. Unswept gross wing area (wing only-excluding canard) is 385 sq ft; exposed wing area is 282 sq ft. Aspect ratio varies from 8.5 unswept to 1.95 fully swept. Wing sweep is automatically controlled via a Mach Sweep Programmer (MSP) with manual override. The mean wing airfoil is a modified NACA 66(2)-215. Wing dihedral is approximately 0. Wing incidence is approximately 0º

Wing structure consists of two Ti-6A1-4V titanium and one Elgiloy cobalt-chromium-nickel alloy spar, one titanium false spar, thirteen titanium ribs, and multiple graphite/titanium stringers. Titanium face sheets are mated to the spar/rib structure, forming a sealed cell titanium fuel tank. Wing skins consist of a double-hull structure similar to that employed in fuselage construction consisting of a graphite composite (IM9/RP-46) internal hull and a bandpass, aramid composite external skin. Internal and external skins are physically separated, forming a cavity for low observability and armor/protective purposes. All wing leading and trailing edges and lift augmentation devices, including leading edge slats, flaps, ailerons and spoilers are constructed from bandpass aramid composite and thermoset materials. Each wing is equipped with full span leading edge slats and trailing edge, double-slotted Fowler Flaps for lift augmentation. Maximum trailing edge flap deflection is 65º . Leading and trailing edge flaps are actuated by formerly Bertea/National Water Lift hydraulic cylinders. The wing is equipped with 0.20c flapperons for subsonic roll and spoilers.

Each wing incorporates four stores pivot hardpoints; two rated are at 5,000 lbs carriage capacity at +9g, one is rated at 3,000 lbs carriage capacity at +9g and one is rated at 1,000 lbs carriage capacity at +9g. Each wing features three hardpoints which are plumbed for external fuel carriage. Standard external tanks include 370 USG and 600 USG types. Stores pylons pivot automatically to align all stores with the streamline throughout the wing sweep envelope. Wing sweep is limited to 35º with full stores complement. Jettison of inboard wing store permits full wing sweep, thereby limiting each wing to three stores stations in the fully swept position. Wing sweep lockout controls inhibit wing sweep beyond 35º with full stores complement.

CANARDS: The F-26 canard foreplanes are all moving, variable incidence units. Each canard is located abeam the top of the aircraft shoulder air inlets. Leading edge sweep is -32º and trailing edge sweep is -51º . Canard span is 6 feet with canard area and aspect ratio being 33.75 sq ft and 1.066 respectively. Canard mean airfoil is a modified NACA 65A0045 section. Canard dihedral is 3º . The canards are a cantilever structure composed of three titanium spars and eight titanium ribs.

Incorporating titanium stringers, canard skins are aeroelastically tailored IM9/RP46 to prevent departure. RAM is employed for signature reduction. The canards employ aramid/composite leading and trailing edges with titanium backing. Canards are operated collectively for pitch, or differentially for roll authority.

EMPENNAGE: The F-26 empennage consists of a cantilever V-tail mounted at a 55º dihedral angle. Empennage Leading edge sweep is largely 52º , with component sections varying from 40º to 82º . Empennage span is 12 ft, 6 in with unit area and aspect ratio being 114.85 sq ft and 1.36 respectively. Empennage root airfoil is a modified NACA 65A0045 section, with root incidence set at approximately 1º .

The empennage configuration was selected to provide directional control while compensating for

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varying pitching moments associated with wing flap deployment and variable geometry static margin effects. Compensating for a close-coupled arrangement, a distinctive notch in the empennage accommodates the wing throughout the complete range of wing sweep. Yaw, pitch and roll control is provided by ruddervators, acting collectively for pitch, independently for yaw and differentially for super sonic roll. The ruddervator tip contains antennas and warning receivers. Construction consists of four serpentine IM9/RP-46 spars, titanium ribs and IM9/RP-46 geodetic subframe with aramid composite and IM9/RP46 external skins. RAM is employed throughout the empennage structure for signature reduction.

POWERPLANT: The F-26S is powered by a single (one) advanced technology augmented turbofan of the 35,000 to 45,000 lb st class (300 to 400 lb/s mass flow class). The turbofan is fitted with an axisymmetric, Lo-Observable, thrust vectoring nozzle. The F-26S turbofan is mounted in a modular, universal engine bay capable of accommodating a variety of powerplant makes/models of a similar thrust class. The F-26S configuration marketed to NATO/Allies may be powered by any of the following powerplant models, based upon export approval and customer choice:

(1) x P&W F119-PW-100 /or/
(1) x P&W F135 /or/
(1) x GEAE F136 /or/
(1) x GEAE F110-GE-(129,132, etc.)

F-26 STALMA turbofans are largely interchangeable with the F/A-22 RAPTOR F119 powerplant, or F/A-35 F135/F136 powerplants with exception of Stavatti's integration of a LO, axisymmetric thrust vectoring nozzle.

All F-26 powerplants of either P&W or GEAE type feature Full Authority Digital Engine Control (FADEC) with hydromechanical backup. The F119/F135 turbofans are of two-shaft, low bypass ratio type with three stages of snubless wide-chord fan blades. F119/F135 compressors are of multi-stage type, while the turbines are of single stage, contra-rotating type. F-26S self-start capability is provided by an Allied Signal G250 APU.

JP-8 fuel is supplied via a pressurized fuel delivery system composed of nine independent fuel cells, including seven, self-sealing stainless steel fuselage tanks and two self-sealing titanium wing tanks. Total internal fuel capacity is 17,835 lbs (2,744 US Gal). Standard Aircraft Design Weight internal fuel load is 10,670 lbs.

Fuel tanks are fitted with tear-resistant self-sealing cells lined with reticulated foam. An On-Board Inert Gas Generation System (OBIGGS) is available as a customer option. A single point refueling interface is located on the lower fuselage, while gravity refueling may be accomplished via two gravity feed ports on either side of the top fuselage. Provisions for in-flight refueling include a dorsal fin integrated Universal Aerial Refueling Receptacle Slipaway Installation (UARRSI) and a left fuselage mounted retractable in-flight refueling probe, allowing the F-26 to receive fuel from either flying-boom or probe-and-drogue tanker aircraft.

AIR INTAKES: Powerplant mass flow is supplied by a dual air inlet system. Airflow for optimum subsonic, high AoA performance is supplied by a ventral pitot inlet. Airflow for optimum supersonic, high performance cruise is supplied by twin, shoulder mounted, bifurcated internal compression variable shock inlets. The air intake system is capable of delivering mass flows between 300 and 400 lbs/s over a range of Mach numbers in excess of Mach 2.8. Developed to maintain high pressure recoveries, the inlet system serves the demands of the F-26 F119/F135/F136 powerplant.

COCKPIT & INSTRUMENTATION: The F-26 cockpit is configured for single pilot seated on a Martin Baker MK16 zero/zero ejection seat. Developed to assure reduced pilot workload, the cockpit is pressurized using an AiResearch air conditioning system. Standby pilot oxygen is provided by a Litton molecular sieve oxygen generating system (MSOGS). Incorporating a single piece bubble canopy, 360º all around, 13º over-the-nose and 40º over-the-side visibility is provided. The canopy is of iridium coated, frameless, clamshell type, electrically pivoted upward and aft for cockpit access. The canopy is defrosted and purged of

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precipitation using a perimeter high pressure, hot air system. Featuring a HOTAS flight controls arrangement, the F-26 man/machine interface consists of a centrally mounted control column and full deflection, pilot adjustable rudder pedals. Displays and instrumentation consist of traditional analogue and advanced Full-Color, Multi-Functional Liquid Crystal Displays. The F-26 primary visual reference instrument is an Ericsson EP-17 Head-Up Display (HUD) offering a 20° x 28º Field-of-View (FoV) with color raster video.

Secondary visual referencing is accomplished via four LCDs (including a 6 x 6-in, 6 x 8-in and two 9.5 x 10.5-in displays for a total display area of 285 sq in) and nineteen analogue flight reference instruments including:

- *Airspeed Indicator/Machmeter (3 1/8-in diameter)*
- *Attitude Indicator/Artificial Horizon (3 1/8-in diameter)*
- *Altimeter (3 1/8-in diameter)*
- *Vertical Speed Indicator (3 1/8-in diameter)*
- *HSI/DME with ILS (3 1/8-in diameter)*
- *Tachometer (3 1/8-in diameter)*
- *Exhaust Gas Temperature (3 1/8-in diameter)*
- *Turbine Inlet Temperature (3 1/8-in diameter)*
- *Turn and Bank Indicator (3 1/8-in diameter)*
- *Fuel Quantiy (3 1/8-in diameter)*
- *Fuel Flow (3 1/8-in diameter)*
- *Nozzle Power Setting (2 1/4-in diameter)*
- *Oil Pressure and Temperature (2 1/4-in diameter)*
- *Volts/Amps (2 1/4-in diameter)*
- *Cabin Pressure(2 1/4-in diameter)*
- *Accelerometer(2 1/4-in diameter)*
- *AoA indicator(2 1/4-in diameter)*
- *Wing Sweep Position Indicator (2-in diameter)*
- *Hydralic Pressure(1 1/2-in diameter)*
- *Compass (1 1/2-in diameter)*

An illustration of the F-26S panel is provided:

Facilitating VFR and IFR operations, the cockpit is designed to for Generation III night vision compliance and operability with Helmet Mounted Cuing Systems.

AVIONICS & SENSORS:

The F-26 features an advanced integrated avionics system, incorporating proven operational capability and leading technologies. A modular platform, the aircraft was developed to incorporate a variety of avionics as Line Removable Units (LRUs). Avionics integration is performed by STAVATTI as per customer requirements.

F-26S avionic systems are integrated via a STAVATTI proprietary computational network of secure **black-boxes** operating within the context of a MIL-STD-1553B Interface Bus. The **S**tavatti **P**roprietary **C**omputer **N**etwork (SPCN) incorporates all necessary computational systems responsible for flight control, navigation, fire control, targeting, autonomous flight modes, Military-Off-The-Shelf (MOTS) Line Removable Unit (LRU) integration and sensor fusion. As the SPCN is of proprietary nature, it is black-boxed and componentized into tamper-resistant (self-destruct in event of tamper) LRUs, eliminating customer interface on either hardware or software levels. F-26S customers/operators interface with the SPCN through a Graphical User Interface (GUI) firewall/operating system. The SPCN employs Extremely High Speed Integrated Computers (EHSIC) which benefit from photonic processors implementing Zhegalkin logic. F-26 SPCN computers and processors are programmed in the FORTH computer language.

The SPCN is an extremely advanced architecture which has never before been integrated into an unclassified military aircraft. Its use of photonic transistors and the logical application of a programming language which actually works (FORTH), results in a system which not only operates continuously over decade durations without crashing, but with far less complexity than current approaches as employed in F/A-22 or F/A-35 platforms. Benefiting from an open architecture, the SPCN features software driven functionality enabling hyper-redundancy as functions can be distributed among a number of F-26S computers. The photonic/FORTH/ Zhegalkin computational architecture grants the STALMA extreme flexibility in avionic configurations/ upgrades. Further benefit is derived from the fact that the SPCN is designed to communicate with and permit the integration of a variety of MOTS avionic systems.

The SPCN is the backbone which governs how the aircraft thinks and completes its mission. MOTS avionic systems (be them radar sets, radio units, IFF transponders, ECM pods, etc.) “plug-

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into" the SPCN backbone, allowing the SPCN to both manage their operation while presenting true sensor/system fusion to the pilot as graphically represented on the over 285 sq in of F-26S HDD multi-functional LCD displays. As the SPCN consists of tamper-resistant, "black-boxes" a firewall is forged which enables the removal and replacement of avionic LRUs without interfacing with the SPCN. Furthermore, as the SPCN is black-boxed, it enables the F-26S to benefit from a highly sophisticated avionics architecture without restricting aircraft/air weapon system exportability to qualified U.S. and NATO allies or compromising national security. All SPCN components are manufactured solely within the U.S. by STAVATTI Industry Partners. FORTH language programming of SPCN software, both on the machine code and GUI level, is performed internally by STAVATTI and considered proprietary/trade secret. In summary, all F-26S avionics, sensor, flight control and EW systems are integrated through the black-boxed SPCN.

The F-26S configuration as marketed to NATO/Allies will feature some, or all (to ensure fail-safe redundancy), of the following specific avionics and sensor systems as selected by the customer and as approved for export release by DTC. All of the following avionics and sensors are/would be integrated via the SPCN as LRUs. Note that some avionics systems incorporate integrated systems/features which would permit STAVATTI to market the specific F-26S configuration without particular avionic systems listed herein (i.e, use of the TRW AN/ASQ-220 ICNIA would eliminate the F-26S requirement for the AN/APX-76V, however, NATO members may desire F-26S models which do not feature the AN/ASQ-220, hence the AN/APX-76V is an option.) STAVATTI attempts to ensure absolute flexibility in avionics configurations to ensure absolute pilot satisfaction.

NATO STANDARD F-26S AVIONICS & SENSORS:

- *Raytheon AN/APG-79 multi-mode radar with AESA*
- *Litton LN-100G Ring Laser Gyro INS/Embedded GPS*
- *Honeywell H-764G Embedded GPS/INS*
- *Rockwell Collins AN/ARN-153 Digital TACAN*
- *Rockwell Collins AN/ARN-112 ILS*
- *Rockwell Collins ARN/ALN-147 ILS*
- *Rockwell Collins ADF-462 ADF Receiver*
- *Rockwell Collins HSI (Generic)*
- *Rockwell Collins AN/ARN-149 ADF*
- *GPS with PPS(Y) access (Generic)*
- *Rockwell Collins AN/ARC-210(V) Airborne Transceiver*
- *Rockwell Collins AN/ARC-186R Airborne Transceiver*
- *Elta/IAI ARC 740 VHF/UHF Communications System*
- *Harris FOTR Fiber-Optic Transceiver*
- *Raytheon KY-58 TSEC Secure Voice System*
- *AN/APX-76V Interrogator*
- *Litton AN/APX-109 IFF Transponder*
- *BAE Systems AN/APX 111 IFF Transponder*
- *BAE Systems AN/APX-113 IFF Transponder*
- *Raytheon AN/APX-114 IFF Interrogator*
- *BAE Systems NGS Integrated Air Data System*
- *BAE Systems AN/ARN-138*
- *Raytheon IFF 4500 IFF Interrogator*
- *TRW AN/ASQ-220 ICNIA*
- *BAE Systems RT-1805/APN LPoI Altimeter*
- *NAVCOM AN/APN-232 CARA Radar Altimeter*
- *Honeywell HG9550 Radar Altimeter*
- *LINK4 or LINK11 or LINK 16 Data Link (Generic)*

In addition to internal avionics, the F-26S incorporates provisions for a Lockheed Martin LANTIRN externally mounted sensor/designator package including an AN/AAQ-13 navigation and a AN/AAQ-14 targeting pod or an internally integrated Raytheon ATFLIR.

F-26S avionics are integrated to comply with appropriate COMSEC/TRANSEC/TEMPEST requirements. The F-26 is equipped with a Cockpit Video Recording (CVR) system as well as a crash survivable Flight Data Recorder (FDR), an onboard fatigue monitoring system, a crash survivable Crash Position Indicator (CPI) and a crash survivable Underwater Locator Beacon (ULB). A Halon 1301 replacement agent will be employed for avionic system fire suppression as soon as such a compound is invented/mil qualified/certified.

FLIGHT CONTROLS: The F-26S flight control system consists of an SPCN integrated, STAVATTI proprietary, quadrupleplex Power-By-Wire (PBW) system benefiting from fuzzy logic and programmed in FORTH. Stavatti is responsible for the programming of all flight control laws. PBW hydraulic servo actuators are provided by Lockheed Martin Control Systems (LMCS). The flight control system provides control of the aircraft through the movement of the primary control sur-

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faces. Primary control surfaces consist of ailerons, all moving canard foreplanes, all moving empennage slab sections, spoilers for DLC, and a Pitch/Yaw Balanced Beam Exhaust Nozzle (PYBBEN) dependent upon customer powerplant selection. Deflection of control surfaces is achieved by the control column and rudder pedals. Yaw control is achieved through independent deflection of empennage slab sections. Pitch authority is controlled by symmetrical deflection of canard foreplanes and empennage slab sections. Roll authority is achieved at M= 0.85 through aileron deflection and through differential deflection of canard foreplanes and empennage slab sections at M = 0.86. The PYBBEN will actively augment pitch and yaw control authority.

LANDING GEAR: The F-26 employs hydraulically actuated, retractable tricycle landing gear. The main landing gear consists of independent, trailing link units which retract rearward into afterbody empennage integration fairings. Nose landing gear retracts forward. Main and nose landing gear utilize single and twin wheel units respectively. All landing gear units employ carbon fiber disk brakes and nitrogen charged oleo pneumatic shock struts. The landing gear is capable of unprepared, forward operations and sink rates of 24 ft/s. Maximum landing gear deployment airspeed is 300 kts.

The utility hydraulic system is responsible for normal landing gear operation. In the event of failure, either the primary or utility hydraulic systems may be cross fed for landing gear retraction. Nose landing gear may be gravity extended and mechanically locked and main landing gear may be pneumatically extended and locked in the event of complete system shutdown. An arresting hook suitable for land based recovery is provided. An arresting hook is not necessary for carrier operations. Wheelbase is 15 ft 10 in. F-26 wheel track is 9 ft 10 in.

SYSTEMS: Primary F-26 systems include Hydraulics and Electrical. The F-26 hydraulic system is rated at 4,000 psi and 72 g/m. Hydraulic power is necessary for wing sweep, landing gear actuation, air inlet control, nose wheel steering, wheel brakes, speed brakes, emergency electrical power generation and some flight control actuators. Hydraulic power is supplied by two, independent systems designated as the primary and the utility system. The system is redundant such that in the event of failure of one system, either system is capable of supplying power for wing sweep, flight control operation and landing gear deployment. Hydraulic power for each system is provided by engine driven, variable delivery pumps. Pressurized accumulators are installed in the system to supplant engine-driven pump delivery during transient hydraulic power requirements. Piston type reservoirs are provided for hydraulic fluid storage and surge damping for return line pressures within each system. To insure critical pump inlet pressure for all operating conditions, the reservoirs are pressurized with nitrogen.

The F-26 electrical system supplies 115 volt, three-phase, 400 cycle AC power and 28 volt DC power. Four independent sources are used for power generation consisting of a primary generator, auxiliary power unit (APU), batteries and a secondary generator. AC power is supplied by a single powerplant driven Sunstrand 90 kVA AC generating system. DC electrical power is provided by 28 Volt transformer-rectifier units and four 24 Volt sealed cell batteries.

External Lighting consists of standard wing tip mounted navigation lights and empennage strobe. Landing lights are featured on the aircraft retractable nose gear strut and ventral fuselage ports. Additional formation lighting is featured per request. Internal lights include service illumination for all major access areas, including engine bay access, fuel port, radome, entry and egress, external hardpoint overhead, etc. Standard cockpit lighting is provided to industry standards.

ELECTRONIC WARFARE: The F-26S employs an internal Electronic Counter Measures Suite (ECMS). The ECMS is fully integrated via the SPCN and consists of internally mounted antennas, receivers and necessary LRUs. The F-26S has been designed to accommodate a wide variety of internal ECM equipment, however, the ECMS as configured for NATO/Allies will be marketed to employ any or all of the following ECM systems, pending customer requirements and prior DDTC approval:

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NATO STANDARD F-26S ECM:

- *Raytheon ALR-67(V)3 Countermeasures Set*
- *Sanders AN/ALR-94 Integrated Contermeasures Set*
- *AN/ALQ 135 Internal Countermeasures Set*
- *AN/ALQ-214 Internal Countermeasures Set*
- *AAR-58 Missile Warning System*
- *Six (6) to Twelve (12) BAe AN/ALE-47 Dispensers*
- *Raytheon AN/ALE-55 decoy.*

The F-26S incorporates EW hardening in TEMPEST compliance to ensure survivability in the EM Pulse Weapon Environment. The F-26S EW system accommodates a wide variety of external jamming pods and countermeasures dispensers including:

- *ALQ-119(V)-15 or ALQ-119(V)-17*
- *QRC 80-01(V)- 3*
- *ALQ-131(V)-1*
- *ALQ-184(V)-2*

LOW OBSERVABILITY (LO): The F-26S employs technologies to significantly reduce Radar Cross Section (RCS), infrared signature, electromagnetic signature, visual signature and aural signature. RCS reduction represents the paramount LO feature considered in STALMA design.

To reduce all-aspect aircraft, RCS, the F-26 STALMA employs Proprietary **Cold Plasma Active Stealth** technology. Plasma active stealth employs plasma within the principal scattering areas of the target so as to attenuate or absorb incident microwave (radar) electromagnetic signals, masking the target. F-26 STALMA Plasma Active Stealth technology is directly dependent upon an interaction of a cold plasma confined within a cavity between the aircraft bandpass external hull/skins and the internal shaping provided by a second, non-bandpass internal hull.

The cold plasma confined within the cavity is generated through the use of a series of multiple plasmatrons specifically engineered by a STAVATTI Industry Team Member (ITM). The plasmatrons supply a specific cold plasma to a distribution network which consists of a series of integrated cell cavities. Plasma density is controlled at the point of generation, while frequency is controlled in part locally at the cell level. Each cell cavity has integral EM management systems to provide a level of plasma manipulation. Elements of the plasma generation and distribution system are Line Removable Unites (LRUs), enabling removal and replacement on a unit component level. Plasma manipulation, generation, distribution and overall management is the responsibility of the STALMA's computational network which accesses threat radar type and frequency via the aircraft's RWR and ECM/self protection system and subsequently managing the active stealth system in an intelligent manner.

The COld Plasma Cavity Active Stealth Technology (COPCAST™) system as featured in the F-26 STALMA is an advanced approach to LO technology which ultimately results in a sixth generation class combat aircraft with commensurate stealth characteristics. Resulting clean F-26S mean RCS is on the order of 0.006 square meters.

To enable air-to-air combat while maintaining a "clean" configuration, the F-26S features two independent, internal weapons bays for compact internal stores carriage including both the STAVATTI CGM-4 tube-launched short range AAM as well as 250 LB class precision guided munitions. Carriage of compact stores within these internal weapons bays permits a capably armed F-26 to function in a "clean" RCS configuration.

To reduce RCS while carrying external stores, the F-26 can be equipped with Radar Elusive Tactical Stores Dispensers (RETSD™), developed by STAVATTI. These dispensers allow the STALMA to carry wing mounted external stores without compromising LO features. This allows the STALMA to conduct precision strike and air-to-air engagements with limited detectability.

Both the RETSD and CGM-4 are STAVATTI developed defense products which may be marketed to potential F-26S customers/operators. As they are stand-alone systems, they require stand-alone prior marketing and export approval from DDTC and are considered "beyond-the-scope" of this document. They are included in this document for reference purposes only, and to provide a greater understanding of F-26S design philosophy in the context of an Integrated Weapon System.

Reduction of IR emissions is achieved through the use of a dedicated engine bay cooling/IR signature reduction system. Ducting residual inlet air through the Powerplant Signature Reduction Shroud (PSRS), significantly reduces aircraft IR signature both in the subsonic and supersonic regime. Coupled with Lo-Axi™ or similar LO turbofan exhaust nozzle, the aircraft IR signature is substantially reduced.

Aural signature is reduced in part through the PSRS. For enhanced aural signature reduction, STAVATTI is considering Active Frequency Damping (AFD) and comparable active noise control systems. Visual signature is reduced through employment of smokeless turbofans (F119) and by limiting overall aircraft size.

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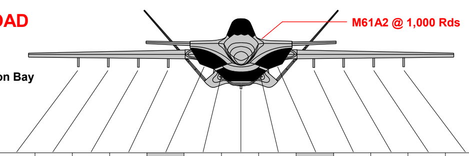
ARMAMENT & WARLOAD: The F-26S air weapon system enables the delivery of conventional and nuclear weapons in various configurations, in air-to-air and air-to-ground modes. Fixed internal armament includes a single (one) 20 mm M61A2 Vulcan cannon. Located in the port mid-fuselage, the cannon is equipped with a retractable muzzle cover. The aircraft is equipped with 1,000 rounds of 20mm PGU-28A/B (M70LD) SAPHEI, PGU-27A/B TP or PGU-30A/B TP-T ammunition. Alternatively, the F-26S may be equipped with a single, fixed, internal 30mm Oerlikon KCA cannon with 400 rounds or a single, fixed, internal 30mm GAU-13/A with 350 rounds. Internal gun armament is selected by the customer and is dependent upon DDTC export approval.

Expendable internal armament is carried in two internal weapons bays mounted ventrally within each of the aircraft port/starboard internal compression air intakes. Each internal weapons bay is rated to a 1,000 lbs stores load and is suitable for carriage of compact stores including 250 lb precision guided Small Diameter Bombs (SDBs) and the STAVATTI CGM-4 compact short-range AAM. The STALMA internal weapons bay can carry a total of four SDBs or eight CGM-4s.

External armament includes over 25,000 lbs of stores/ordinance. External stores are carried on eight wing and five fuselage hardpoints. Of the thirteen available stores stations, six are rated to 1,000 lbs, two are rated to 3,000 lbs, four are rated to 5,000 lbs and one is rated to 2,500 lbs maximum external carriage capacity at a +9g load factor. Maximum stores station support ratings are reduced at greater load factors. All stores may be jettisoned simultaneously or individually by selection. MIL-STD-1760 Weapon Interface Data Bus serves as aircraft weapon system integration backbone.

The F-26 will be qualified and equipped to carry a wide variety of external ordinance. Based upon hardpoint rating, ultimate stores selection will be determined in the field. The aircraft was engineered to incorporate mission flexibility, employing universal weapons mount lugs, typically employing 14 to 30 inch suspension lug spacing and industry standard weapons release pylons. Standard missile and ordinance systems which the STALMA will be qualified to release will include the AIM-9, AIM-120, AGM-65, AGM-88, GBU-32, GBU-35, B61, AIM-7,Skyflash, Python etc. A **Warload Table** depicting STALMA stores stations locations, maximum load rating at design load factor and possible stores configurations is provided:

F-26S WARLOAD



= Internal Weapon Bay

Station Number	1	2	3	4	5	6	7	8	9	10	11	12	13
CGM-4 (Stavatti)													
SDB-1 (Stavatti)													
AIM-120													
AIM-9 Sidewinder													
B61													
AGM-65 Maverick													
AGM-154 JSOW													
AGM-88 HARM													
AGM-84 Harpoon													
CBU-97/B SFW													
GBU-22/Mk.82													
GBU-32/Mk.83													
GBU-31/Mk.84													
GBU-37/GAM-113													
AN/ALQ-131/184													
300 U.S. Gal Tank													
370 U.S. Gal Tank													
600 U.S. Gal Tank													
Rating (lb) @ +9g	1000	3000	5000	5000	1000	1000	2500	1000	1000	5000	5000	3000	1000

Note: Ejector racks on stations 4 and 10 must be jettisoned to exceed 35° wing sweep

SERVICEABILITY: A Maintenance Monitor Panel (MMP) is located within the nose wheel well to provide ground personnel immediate access to information regarding system failures. To streamline preflight inspection, a consumable panel is located under the left main wing indicates critical consumables levels including engine, drive system, and APU oil, Liquid Oxygen, hydraulic fluid, radar and missile seeker head coolant, fire suppress ant foam levels, ammunition quantity and tire pressure. A Maintenance Signal Data Recorder (MSDC) is integrated to provide mission acquired data derived from independent pin-point sensors and cross checked with the central air-

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frame computer regarding the status of powerplants, avionics, armament, and airframe structural integrity. The F-26 has approximately 100 access panels and reduced lubrication points.

STALMA maintenance serviceability is estimated at a Mean Time Between Failures (MTBF) of 10.64 hours with 8.14 Maintenance Man Hours per Flight Hour (MMH/FH). The STALMA is expected to display a 98% sortie availability rate. Stavatti goals include a reduction in MMH/FH to 5.0 or less by the 250th production unit, with a corresponding increase in MTBF to 15.0 hours our beyond. Reducing the support spares inventory, the STALMA requires less than 1,500 maintenance support items in-stock. The wide variety of subsystems dictates end user serviceability. As an airframe, the aircraft has been designed to minimize support equipment and MMH/FH. Final avionics/systems selection will ultimately determine actual maintenance requirements.

SQUADRON TOTAL SYSTEM SUPPORT (STSS)

The basic per unit flyaway cost of the F-26 STALMA aircraft of NATO/Allied Standard Weapon System Configuration (SWSC) does not include the costs of a wide variety of traditional stores, ordinance, training and ground support/logistical equipment.

STAVATTI is dedicated to providing a fully integrated support package, as demonstrated by our presentation of SQUADRON TOTAL SYSTEM SUPPORT (STSS) packages. The STSS allows STALMA operators to procure not only aircraft, but all necessary stores, basic maintenance and logistical support materials necessary to keep your forces flying. The STSS is focused upon supporting operations on the squadron level, consisting of 12 to 24 aircraft of identical model. Contact STAVATTI for additional information regarding STSS and total lifetime logistical support.

F-26S EXTERNAL DIMENSIONS & AREAS

Overall Dimensions

Span (5°/70°)	57 ft 0 in/30 ft 4 in
Length	49 ft 9 in
Height	14 ft 0 in
Gross Wing Area	450 sq ft

Wing

LE Sweep	5° to 70°
Span	57 ft 0 in/30 ft 4 in
Area	385 sq ft
Dihedral	0º
Incidence	0º
Aspect Ratio	8.5/1.95
MAC, 5°	7 ft 1 in
Mean Airfoil	NACA 66(2)-215

Canard

LE Sweep	-32º
Span (Unit)	6 ft 0 in
Area	65 sq ft
Dihedral	3º
Incidence	-90º to +90°
Aspect Ratio	1.07
MAC	5 ft 10 in
Mean Airfoil	NACA 65A0045

Empennage

LE Sweep (Reference)	52º
Span (Unit)	12 ft 6 in
Area	230 sq ft
Dihedral	55º
Incidence	0º
Aspect Ratio	1.36
MAC	10 ft 3.5 in
Mean Airfoil	NACA 65A0045

Landing Gear (All Models)

Wheel Base	15 ft 10 in
Wheel Track	9 ft 10 in

All Aspect RCS (Mean) 0.006 sq meters

F-26S WEIGHTS & CAPACITIES

Dry Empty Weight	15,605 lbs
Aircraft Operating Weight	16,035 lbs
Design Take-Off Weight (DTOW)	27,850 lbs
Design Internal Fuel (JP-8)	10,205 lbs
Design Warload	1,610 lbs
Max. Internal Fuel (JP-8)	17,690 lbs
Typical Take-Off Weight (TTOW)	36,500 lbs
Typical Warload	2,775 lbs
Max. Take-Off Weight (MTOW)	60,750 lbs
Max. Warload/External Load	27,025 lbs

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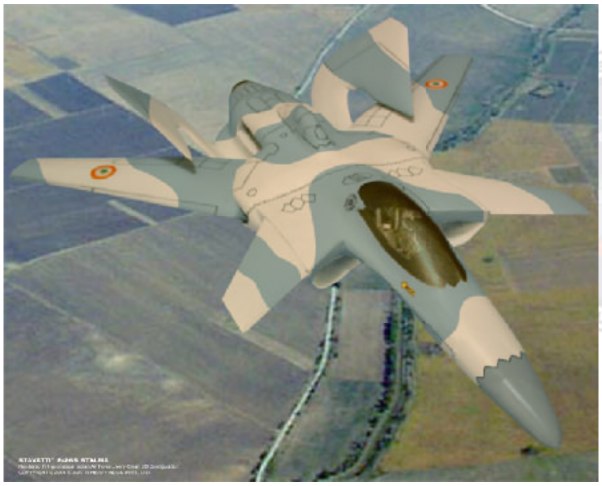
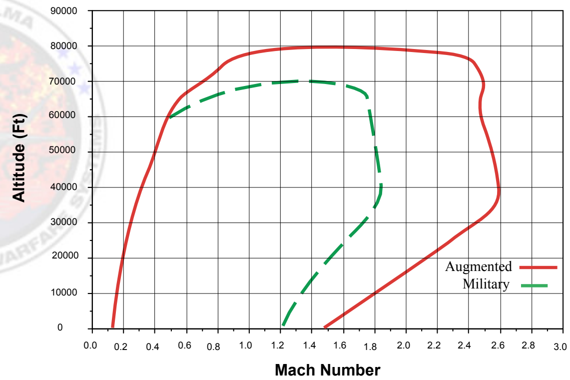
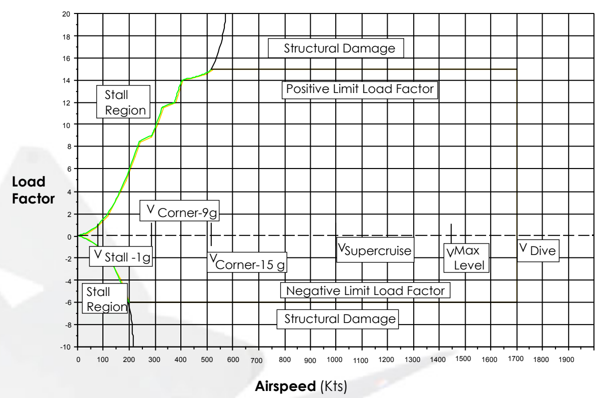


F-26S STALMA Operational Flight Envelope (Nominal)

@ 27,850 lbs; Load Factor=1



F-26 STALMA V-n Diagram @ 27,850 lbs DTOW



F-26S PERFORMANCE & LOADINGS

All performance estimates are based upon a standard F-26S STALMA aircraft, in the Design (Combat) Takeoff Weight Configuration-DTOW of 27,850 lbs with 4 AIM-120C AAMs carried externally under ISA, standard day conditions. Takeoff and landing field lengths are based on level, hard surface runways with zero wind.

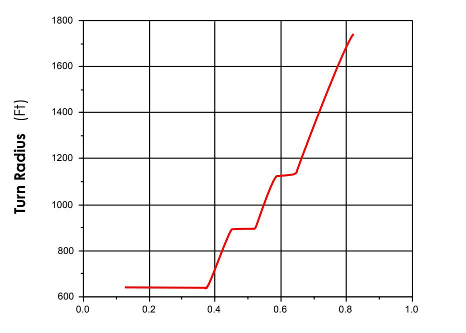
Max Level Speed @ SL-AB	1.4 Mach
Max Level Speed @ SL-MIL	1.2 Mach
Max Level Speed @ 40,000 ft-AB	2.4 Mach
Max Level Speed @ 40,000 ft-MIL	1.8 Mach
Recommended Cruise @ 35,000 ft	0.9 Mach
Stall Speed Flapped @ SL	81 Kts
Approach Speed Flapped @ SL	100 Kts
Stall Speed Clean @ SL	119 Kts
Approach Speed Clean @ SL	142 Kts
7.5 G Corner Speed Flapped @ SL	275 Kts
7.5 G Corner Speed Clean @ SL	390 Kts
9.0 G Corner Speed Flapped @ SL	300 Kts
9.0 G Corner Speed Clean @ SL	425 Kts
Climb Rate @ SL Exceeds (ft/min)	75,000
Service Ceiling Exceeds (ft/min)	75,000
Tactical Radius; Lo-Lo-Lo	650 nm
Tactical Radius; Hi-Lo-Hi	800 nm
Max Cruise Range; Internal Fuel	1,800 nm
Ferry Range With External Fuel	3,400 nm
Max Performance Takeoff Length	400 ft
Max Performance Landing Length	750 ft
Wing Loading-5°LE @ DTOW	62 lbs/sq ft
Wing Loading-70° LE @ DTOW	97 lbs/sq ft
Wing Loading-5° LE @ MTOW	62 lbs/sq ft
Wing Loading-70° LE @ MTOW	97 lbs/sq ft
Thrust-To-Weight Ratio @ DTOW	1.4 to 1
Thrust-To-Weight Ratio @ MTOW	0.64 to 1
Design Limit Load Factor @ DTOW	+15/-6 G
Design Limit Load Factor @ MTOW	+9/-3 G

F-26 STALMA Maximum Turn Rate at Load Factor-Sea Level

@ 27,850 lbs DTOW; 5° LE Wing Sweep

F-26 STALMA Maximum Turn Radius at Mach Number-Sea Level

@ 27,850 lbs DTOW; 5° LE Wing Sweep



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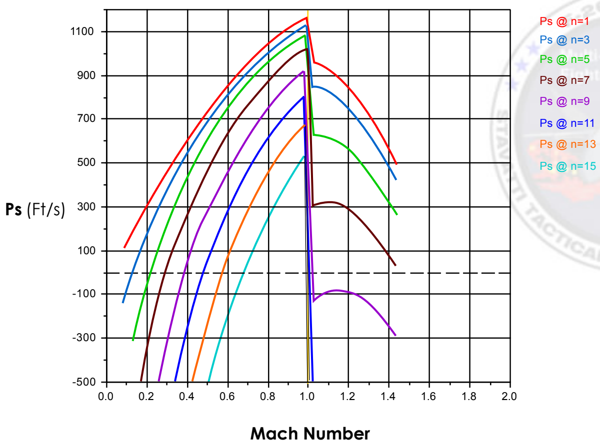
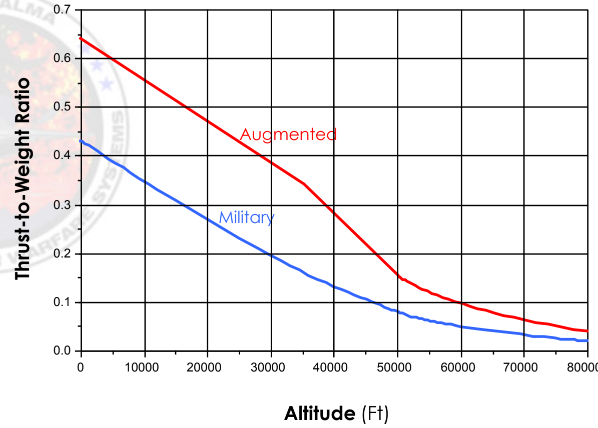
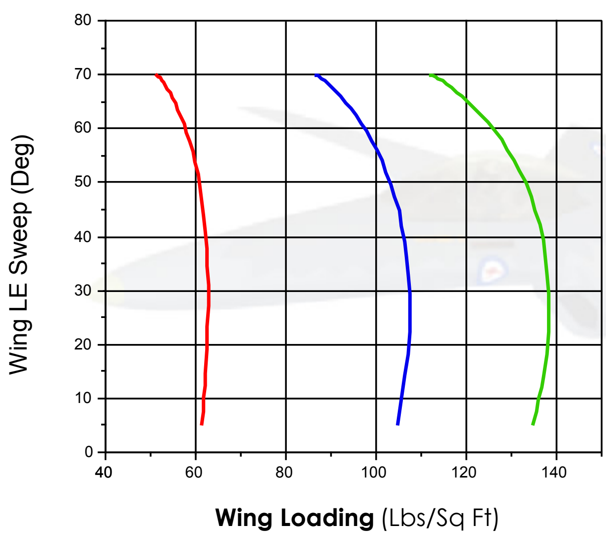
F-26 STALMA Ps Curve-Sea Level
@ 27,850 lbs DTOW



F-26 STALMA Thrust-to-Weight Ratio
@ 60,750 lbs MTOW



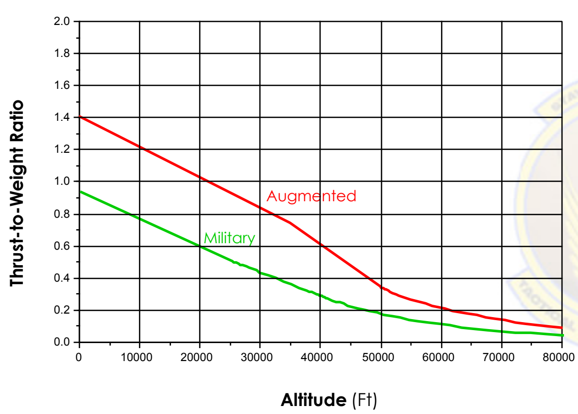
F-26 STALMA Wing Loading



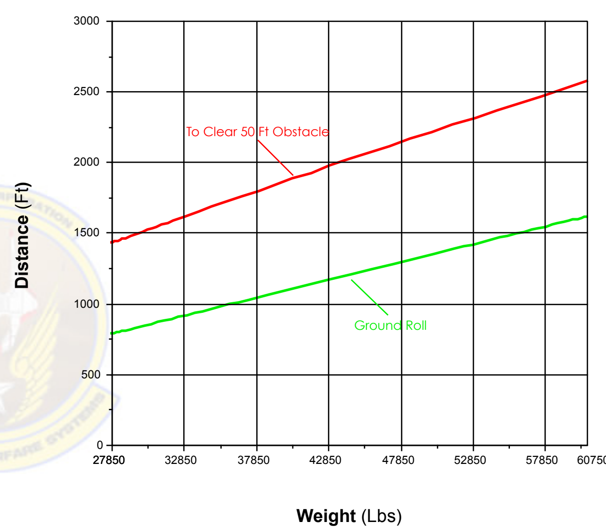
W/S @ 27,850 lbs Design Weight
W/S @ 47,200 lbs Standard Gross Weight
W/S @ 60,750 lbs Maximum Gross Weight

F-26 STALMA Take-Off Distance @ Sea Level
With 5° LE Sweep, Optimal Flaps and Full AB

F-26 STALMA Thrust-to-Weight Ratio
@ 27,850 lbs DTOW



F-26 STALMA Landing Distance @ Sea Level
With 5° LE Sweep, Optimal Flaps and Engine Idle



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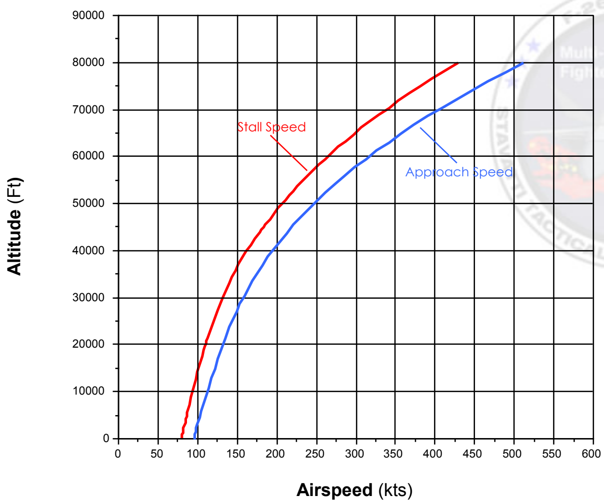
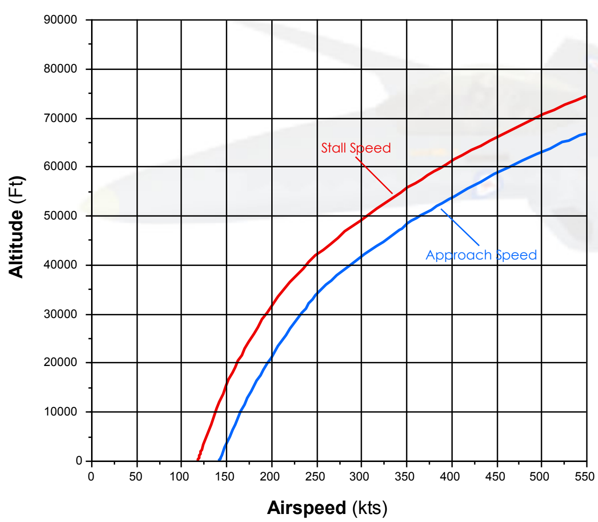
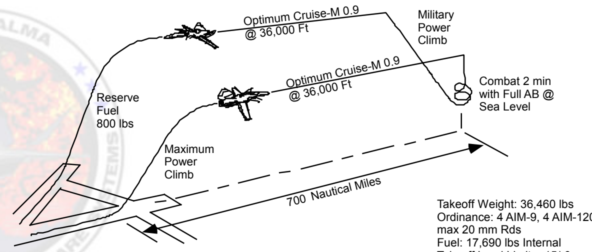
F-26 STALMA Stall and Approach Speeds
@ 27,850 lb DTOW and 5° LE Sweep, Optimal Flaps



F-26 STALMA Stall and Approach Speeds
@ 60,750 lbs and 5° LE Sweep, Optimal Flaps

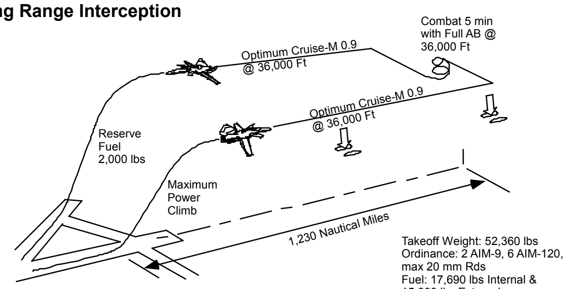


Enhanced Air-to-Air Interception



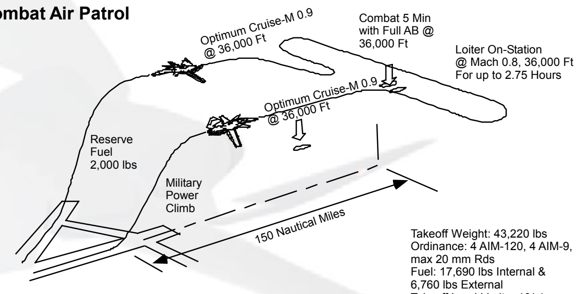
Takeoff Weight: 36,460 lbs
Ordinance: 4 AIM-9, 4 AIM-120, max 20 mm Rds
Fuel: 17,690 lbs Internal
Takeoff Load Limit: +15/-6

Long Range Interception



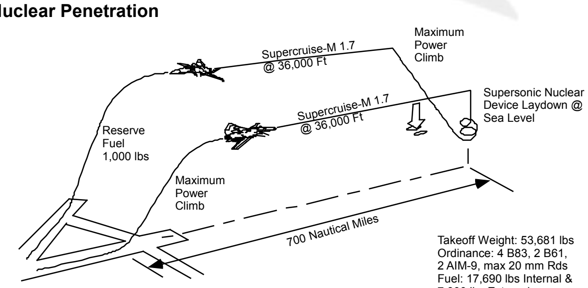
Takeoff Weight: 52,360 lbs
Ordinance: 2 AIM-9, 6 AIM-120, max 20 mm Rds
Fuel: 17,690 lbs Internal & 15,600 lbs External
Takeoff Load Limit: +10/-4

Combat Air Patrol



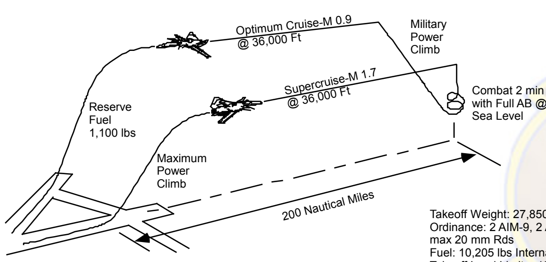
Takeoff Weight: 43,220 lbs
Ordinance: 4 AIM-120, 4 AIM-9, max 20 mm Rds
Fuel: 17,690 lbs Internal & 6,760 lbs External
Takeoff Load Limit: +10/-4

Nuclear Penetration



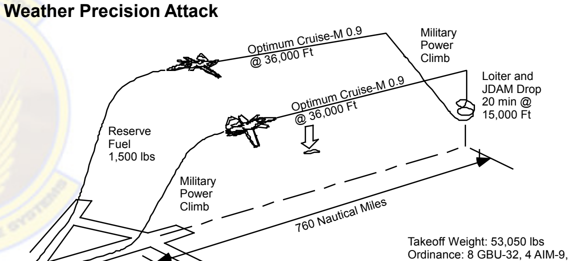
Takeoff Weight: 53,681 lbs
Ordinance: 4 B83, 2 B61, 2 AIM-9, max 20 mm Rds
Fuel: 17,690 lbs Internal & 7,800 lbs External
Takeoff Load Limit: +10/-4

Standard Air-to-Air Interception



Takeoff Weight: 27,850 lbs
Ordinance: 2 AIM-9, 2 AIM-120, max 20 mm Rds
Fuel: 10,205 lbs Internal
Takeoff Load Limit: +15/-6

All Weather Precision Attack



Takeoff Weight: 53,050 lbs
Ordinance: 8 GBU-32, 4 AIM-9, max 20 mm Rds
Fuel: 17,690 lbs Internal & 1,950 lbs External
Takeoff Load Limit: +10/-4

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